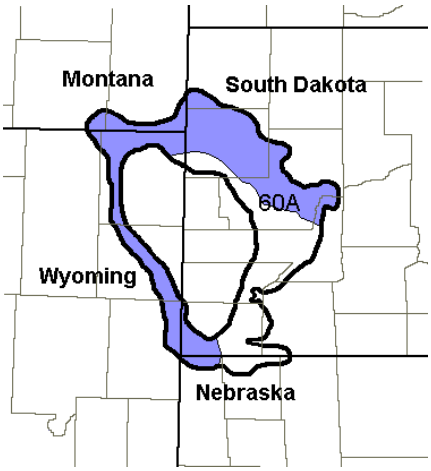
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Loamy 13-16" P.Z.

Site ID: R060AY010SD

Major Land Resource Area: 60A – Pierre Shale Plains

Physiographic Features

This site occurs on nearly level to moderately steep uplands.

Landform: fan, fan remnant, hill, plain and terrace **Aspect:** N/A

	Minimum	Maximum
Elevation (feet):	2500	4300
Slope (percent):	0	15
Water Table Depth (inches):	80	80
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Very low	Very high

Climatic Features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland steppes to the east. Annual precipitation ranges from 13 to 16 inches per year, with most occurring during the growing season. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 46° F. January is the coldest month with average temperatures ranging from about 19° F (Moorcroft CAA, WY) to about 22° F (Belle Fourche, SD). July is the warmest month with temperatures averaging from about 70° F (Moorcroft CAA, WY) to about 72° F (Belle Fourche, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 51° F. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and can continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	Minimum	Maximum
Frost-free period (days):	122	129
Freeze-free period (days):	145	152
Mean Annual Precipitation (inches):	13	16

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.41	7.1	34.1
February	0.44	0.51	12.6	40.1
March	0.65	0.91	19.7	46.5
April	1.43	1.72	29.4	60.2
May	2.45	2.83	39.7	70.6
June	2.34	2.81	48.5	80.1
July	1.60	2.32	54.8	88.0
August	1.24	1.45	53.1	87.7
September	1.01	1.27	42.3	77.0
October	0.90	1.11	31.4	64.9
November	0.40	0.54	19.8	47.5
December	0.40	0.43	10.2	38.0

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
SD0236	Ardmore 2 N	1948	1999
SD0559	Belle Fourche	1948	1999
WY6395	Moorcroft CAA	1948	1998
WY9207	Upton 13 SW	1949	1998

For other climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

No significant water features influence this site.

Representative Soil Features

The soils in this site are well drained and formed in alluvium or residuum from silty or clayey materials. The surface layer is 4 to 12 inches thick. The texture of the profile ranges from sandy loam to clay. The soils have a moderate infiltration rate. Occasionally carbonates will occur at or near the surface on this site. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 10 percent. More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: alluvium, residuum
Parent Material Origin: sedimentary, unspecified
Surface Texture: silt loam, loam, silty clay loam, clay loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0-30
Subsurface Fragments > 3" (% Volume): 0-15

	Minimum	Maximum
Drainage Class:	well	well
Permeability Class:	slow	moderate
Depth to Bedrock (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	8
Sodium Absorption Ratio*:	0	5
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	5	8
Calcium Carbonate Equivalent (percent)*:	0	15

* - These attributes represent from 0-40 inches or to the first restrictive layer.

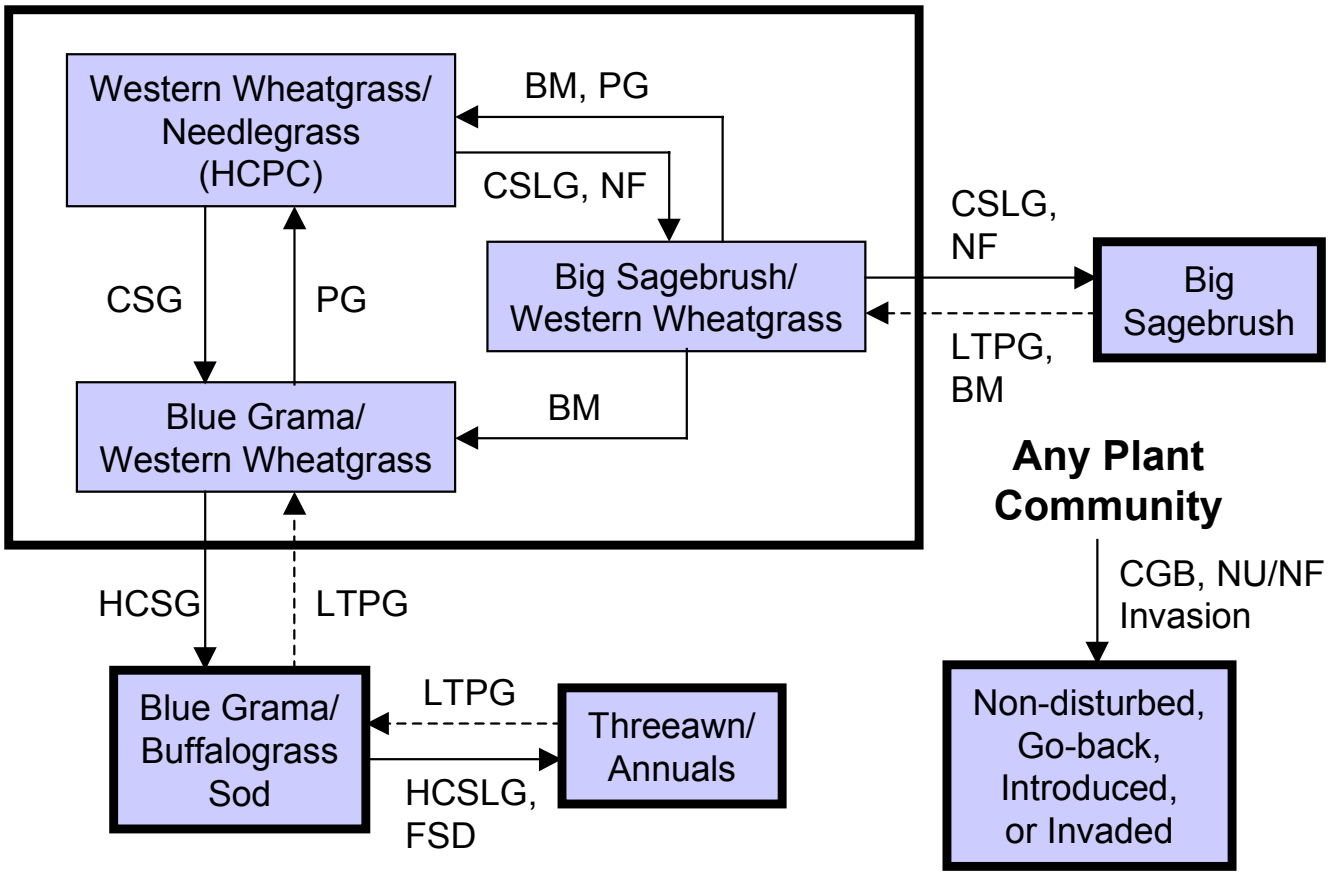
Plant Communities

Ecological Dynamics of the Site:
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



BM - Brush management; **CSG** - Continuous seasonal grazing; **CSLG** - Continuous season-long grazing; **FSD** - Frequent and severe defoliation; **HCPC** - Historical Climax Plant Community; **HCSG** - Heavy continuous seasonal grazing; **HCSLG** - Heavy continuous season-long grazing; **LTPG** - Long-term prescribed grazing; **NF** - No fire; **NU** - Non-use; **PG** - Prescribed grazing.

Plant Community Composition and Group Annual Production

			Western Wheatgrass/Needlegrass (HCPC)		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES				*1520 - 1710*	*80 - 90*
COOL-SEASON MID GRASSES			**1**	**950 - 1140**	**50 - 60**
western wheatgrass	Pascopyrum smithii	PASM	1	380 - 570	20 - 30
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	285 - 380	15 - 20
green needlegrass	Nassella viridula	NAVI4	1	95 - 285	5 - 15
SHORT GRASSES & GRASS-LIKES			**2**	**95 - 285**	**5 - 15**
blue grama	Bouteloua gracilis	BOGR2	2	38 - 190	2 - 10
buffalograss	Buchloe dactyloides	BUDA	2	19 - 95	1 - 5
sedge	Carex spp.	CAREX	2	38 - 190	2 - 10
OTHER NATIVE GRASSES			**3**	**95 - 285**	**5 - 15**
sideoats grama	Bouteloua curtipendula	BOCU	3	95 - 190	5 - 10
big bluestem	Andropogon gerardii	ANGE	3	0 - 95	0 - 5
prairie junegrass	Koeleria macrantha	KOMA	3	19 - 57	1 - 3
Sandberg bluegrass	Poa secunda	POSE	3	0 - 38	0 - 2
bluebunch wheatgrass	Pseudoroegneria spicata	PSSP6	3	0 - 95	0 - 5
little bluestem	Schizachyrium scoparium	SCSC	3	0 - 95	0 - 5
plains reedgrass	Calamagrostis montanensis	CAMO	3	0 - 95	0 - 5
other perennial grasses		2GP	3	0 - 95	0 - 5
FORBS			*5*	*95 - 190*	*5 - 10*
American vetch	Vicia americana	VIAM	5	0 - 38	0 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	5	0 - 38	0 - 2
dotted gayfeather	Liatris punctata	LIPU	5	0 - 38	0 - 2
false boneset	Brickellia eupatorioides	BREU	5	0 - 38	0 - 2
false gromwell	Onosmodium molle	ONMO	5	0 - 38	0 - 2
goldenrod	Solidago spp.	SOLID	5	0 - 38	0 - 2
green sagewort	Artemisia dracunculus	ARDR4	5	0 - 19	0 - 1
heath aster	Symphyotrichum ericoides	SYER	5	0 - 38	0 - 2
hoary puccoon	Lithospermum canescens	LICA12	5	0 - 38	0 - 2
Indian breadroot	Pediomelum esculentum	PEES	5	0 - 38	0 - 2
milkvetch	Astragalus spp.	ASTRA	5	0 - 38	0 - 2
penstemon	Penstemon spp.	PENST	5	0 - 38	0 - 2
prairie coneflower	Ratibida columnifera	RACO3	5	0 - 38	0 - 2
purple coneflower	Echinacea angustifolia	ECAN2	5	0 - 38	0 - 2
purple prairie clover	Dalea purpurea	DAPU5	5	0 - 38	0 - 2
pussytoes	Antennaria spp.	ANTEN	5	0 - 38	0 - 2
scarlet gaura	Gaura coccinea	GACO5	5	0 - 38	0 - 2
scarlet globemallow	Sphaeralcea coccinea	SPCO	5	0 - 38	0 - 2
scurfpea	Psoralidium spp.	PSORA2	5	0 - 38	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	5	0 - 38	0 - 2
western yarrow	Achillea millefolium	ACMI2	5	0 - 19	0 - 1
other perennial forbs		2FP	5	0 - 38	0 - 2
SHRUBS			*6*	*19 - 190*	*1 - 10*
big sagebrush	Artemisia tridentata	ARTR2	6	0 - 95	0 - 5
cactus	Opuntia spp.	OPUNT	6	0 - 19	0 - 1
fringed sagewort	Artemisia frigida	ARFR4	6	0 - 38	0 - 2
leadplant	Amorpha canescens	AMCA6	6	0 - 95	0 - 5
rose	Rosa spp.	ROSA5	6	0 - 57	0 - 3
skunkbush sumac	Rhus trilobata	RHTR	6	0 - 19	0 - 1
snowberry	Symphoricarpos spp.	SYMPH	6	0 - 57	0 - 3
winterfat	Krascheninnikovia lanata	KRLA2	6	0 - 57	0 - 3
other shrubs		2SHRUB	6	0 - 57	0 - 3

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1095 -	1653	- 2010
FORBS	90 -	143	- 195
SHRUBS	15 -	105	- 195
TOTAL	1200 -	1900	- 2400

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community Composition and Group Annual Production

		Western Wheatgrass/ Needlegrass (HCPC)			Blue Grama/ Western Wheatgrass			Blue Grama/Buffalograss Sod			Threeawn/Annuals		
COMMON/GROUP NAME	**SYMBOL**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1520 - 1710*	*80 - 90*		*825 - 935*	*75 - 85*		*450 - 510*	*75 - 85*		*420 - 560*	*60 - 80*
COOL-SEASON MID GRASSES		**1**	**950 - 1140**	**50 - 60**	**1**	**110 - 330**	**10 - 30**	**1**	**12 - 90**	**2 - 15**	**1**	**7 - 70**	**1 - 10**
western wheatgrass	PASM	1	380 - 570	20 - 30	1	55 - 220	5 - 20	1	12 - 30	2 - 5	1	7 - 35	1 - 5
needleandthread	HECOC8	1	285 - 380	15 - 20	1	22 - 110	2 - 10	1	0 - 12	0 - 2	1	0 - 14	0 - 2
green needlegrass	NAVI4	1	95 - 285	5 - 15	1	11 - 55	1 - 5	1	0 - 30	0 - 5			
SHORT GRASS/GRASS-LIKES		**2**	**95 - 285**	**5 - 15**	**2**	**275 - 495**	**25 - 45**	**2**	**270 - 360**	**45 - 60**	**2**	**35 - 105**	**5 - 15**
blue grama	BOGR2	2	38 - 190	2 - 10	2	110 - 220	10 - 20	2	150 - 270	25 - 45	2	7 - 35	1 - 5
buffalograss	BUDA	2	19 - 95	1 - 5	2	55 - 110	5 - 10	2	90 - 120	15 - 20	2	7 - 35	1 - 5
sedge	CAREX	2	38 - 190	2 - 10	2	55 - 110	5 - 10	2	30 - 90	5 - 15	2	7 - 70	1 - 10
OTHER NATIVE GRASSES		**3**	**95 - 285**	**5 - 15**	**3**	**55 - 165**	**5 - 15**	**3**	**30 - 90**	**5 - 15**	**3**	**70 - 315**	**10 - 45**
sideoats grama	BOCU	3	95 - 190	5 - 10	3	22 - 55	2 - 5	3	6 - 18	1 - 3			
big bluestem	ANGE	3	0 - 95	0 - 5	3	0 - 22	0 - 2						
prairie junegrass	KOMA	3	19 - 57	1 - 3	3	11 - 55	1 - 5	3	6 - 30	1 - 5	3	0 - 21	0 - 3
Sandberg bluegrass	POSE	3	0 - 38	0 - 2	3	0 - 33	0 - 3	3	0 - 6	0 - 1	3	0 - 7	0 - 1
bluebunch wheatgrass	PSSP6	3	0 - 95	0 - 5	3	0 - 33	0 - 3						
little bluestem	SCSC	3	0 - 95	0 - 5	3	0 - 22	0 - 2	3	0 - 6	0 - 1			
plains reedgrass	CAMO	3	0 - 95	0 - 5	3	0 - 22	0 - 2	3	0 - 6	0 - 1			
threeawn	ARIST				3	0 - 22	0 - 2	3	6 - 90	1 - 15	3	70 - 245	10 - 35
sand dropseed	SPCR				3	0 - 55	0 - 5	3	0 - 30	0 - 5	3	0 - 21	0 - 3
other perennial grasses	2GP	3	0 - 95	0 - 5	3	0 - 55	0 - 5	3	0 - 30	0 - 5	3	0 - 14	0 - 2
NON-NATIVE GRASSES		**4**			**4**	**0 - 55**	**0 - 5**	**4**	**6 - 30**	**1 - 5**	**4**	**7 - 70**	**1 - 10**
cheatgrass	BRTE				4	11 - 55	1 - 5	4	6 - 30	1 - 5	4	7 - 70	1 - 10
bluegrass	POA				4	0 - 33	0 - 3	4	0 - 12	0 - 2	4	0 - 14	0 - 2
FORBS		*5*	*95 - 190*	*5 - 10*	*5*	*55 - 165*	*5 - 15*	*5*	*30 - 120*	*5 - 20*	*5*	*105 - 210*	*15 - 30*
American vetch	VIAM	5	0 - 38	0 - 2	5	0 - 11	0 - 1	5	0 - 6	0 - 1			
cudweed sagewort	ARLU	5	0 - 38	0 - 2	5	11 - 55	1 - 5	5	6 - 30	1 - 5	5	14 - 35	2 - 5
curlycup gumweed	GRSQ				5	0 - 11	0 - 1	5	0 - 12	0 - 2	5	7 - 35	1 - 5
dotted gayfeather	LIPU	5	0 - 38	0 - 2	5	0 - 11	0 - 1		0 - 6	0 - 1	5	0 - 7	0 - 1
false boneset	BREU	5	0 - 38	0 - 2	5	0 - 11	0 - 1	5	0 - 6	0 - 1			
false gromwell	ONMO	5	0 - 38	0 - 2	5	0 - 11	0 - 1	5	0 - 6	0 - 1			
fetid marigold	DYPA							5	0 - 6	0 - 1	5	14 - 70	2 - 10
goldenrod	SOLID	5	0 - 38	0 - 2	5	0 - 22	0 - 2						
green sagewort	ARDR4	5	0 - 19	0 - 1	5	11 - 33	1 - 3	5	6 - 30	1 - 5	5	7 - 56	1 - 8
heath aster	SYER	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 12	0 - 2			
hoary puccoon	LICA12	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 12	0 - 2			
Indian breadroot	PEES	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 6	0 - 1			
milkvetch	ASTRA	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 6	0 - 1			
mullein	VERBA							5	0 - 12	0 - 2	5	0 - 35	0 - 5
penstemon	PENST	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 12	0 - 2			
prairie coneflower	RACO3	5	0 - 38	0 - 2	5	11 - 22	1 - 2	5	6 - 12	1 - 2	5	0 - 7	0 - 1
purple coneflower	ECAN2	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 6	0 - 1			
purple prairie clover	DAPU5	5	0 - 38	0 - 2	5	0 - 11	0 - 1	5	0 - 6	0 - 1	5	0 - 7	0 - 1
pussytoes	ANTEN	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 12	0 - 2	5	0 - 35	0 - 5
scarlet gaura	GACO5	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 12	0 - 2			
scarlet globemallow	SPCO	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	6 - 18	1 - 3	5	0 - 7	0 - 1
scurfpea	PSORA2	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 30	0 - 5			
sweetclover	MELIL				5	0 - 110	0 - 10	5	0 - 12	0 - 2	5	0 - 70	0 - 10
verbena	VERBE							5	0 - 6	0 - 1	5	14 - 105	2 - 15
western ragweed	AMPS	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	6 - 18	1 - 3	5	7 - 35	1 - 5
western yarrow	ACMI2	5	0 - 19	0 - 1	5	0 - 22	0 - 2	5	0 - 12	0 - 2	5	0 - 7	0 - 1
other perennial forbs	2FP	5	0 - 38	0 - 2	5	0 - 22	0 - 2	5	0 - 12	0 - 2			
SHRUBS		*6*	*19 - 190*	*1 - 10*	*6*	*11 - 110*	*1 - 10*	*6*	*6 - 60*	*1 - 10*	*6*	*35 - 140*	*5 - 20*
big sagebrush	ARTR2	6	0 - 95	0 - 5	6	0 - 55	0 - 5	6	0 - 30	0 - 5	6	0 - 21	0 - 3
broom snakeweed	GUSA2				6	0 - 22	0 - 2	6	6 - 30	1 - 5	6	7 - 70	1 - 10
cactus	OPUNT	6	0 - 19	0 - 1	6	0 - 22	0 - 2	6	6 - 30	1 - 5	6	7 - 70	1 - 10
fringed sagewort	ARFR4	6	0 - 38	0 - 2	6	0 - 55	0 - 5	6	6 - 30	1 - 5	6	14 - 105	2 - 15
leadplant	AMCA6	6	0 - 95	0 - 5	6	0 - 22	0 - 2	6	0 - 6	0 - 1			
rose	ROSA5	6	0 - 57	0 - 3	6	0 - 22	0 - 2	6	0 - 6	0 - 1			
skunkbush sumac	RHTR	6	0 - 19	0 - 1	6	0 - 22	0 - 2	6	0 - 6	0 - 1			
snowberry	SYMPH	6	0 - 57	0 - 3	6	0 - 33	0 - 3	6	0 - 18	0 - 3	6	0 - 7	0 - 1
winterfat	KRLA2	6	0 - 57	0 - 3	6	0 - 11	0 - 1						
other shrubs	2SHRUB	6	0 - 57	0 - 3	6	0 - 33	0 - 3	6	0 - 18	0 - 3	6	0 - 35	0 - 5

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	1095 - 1653 - 2010	545 - 930 - 1315	375 - 492 - 710	270 - 455 - 640
FORBS	90 - 143 - 195	50 - 110 - 170	25 - 75 - 125	100 - 158 - 215
SHRUBS	15 - 105 - 195	5 - 61 - 115	0 - 33 - 65	30 - 88 - 145
TOTAL	1200 - 1900 - 2400	600 - 1100 - 1600	400 - 600 - 900	400 - 700 - 1000

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community Composition and Group Annual Production

		Western Wheatgrass/ Needlegrass (HCPC)			Big Sagebrush/ Western Wheatgrass			Big Sagebrush		
COMMON/GROUP NAME	**SYMBOL**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1520 - 1710*	*80 - 90*		*1120 - 1280*	*70 - 80*		*405 - 495*	*45 - 55*
COOL-SEASON MID GRASSES		**1**	**950 - 1140**	**50 - 60**	**1**	**480 - 640**	**30 - 40**	**1**	**90 - 225**	**10 - 25**
western wheatgrass	PASM	1	380 - 570	20 - 30	1	240 - 400	15 - 25	1	45 - 90	5 - 10
needleandthread	HECOC8	1	285 - 380	15 - 20	1	160 - 240	10 - 15	1	45 - 90	5 - 10
green needlegrass	NAVI4	1	95 - 285	5 - 15	1	32 - 80	2 - 5	1	9 - 45	1 - 5
SHORT GRASS/GRASS-LIKES		**2**	**95 - 285**	**5 - 15**	**2**	**160 - 320**	**10 - 20**	**2**	**45 - 180**	**5 - 20**
blue grama	BOGR2	2	38 - 190	2 - 10	2	80 - 160	5 - 10	2	18 - 45	2 - 5
buffalograss	BUDA	2	0 - 95	0 - 5	2	32 - 80	2 - 5	2	9 - 45	1 - 5
sedge	CAREX	2	38 - 190	2 - 10	2	80 - 240	5 - 15	2	45 - 135	5 - 15
OTHER NATIVE GRASSES		**3**	**95 - 285**	**5 - 15**	**3**	**80 - 240**	**5 - 15**	**3**	**18 - 45**	**2 - 5**
sideoats grama	BOCU	3	95 - 190	5 - 10	3	32 - 80	2 - 5	3	0 - 18	0 - 2
big bluestem	ANGE	3	0 - 95	0 - 5	3	0 - 32	0 - 2			
prairie junegrass	KOMA	3	19 - 57	1 - 3	3	32 - 80	2 - 5	3	9 - 18	1 - 2
Sandberg bluegrass	POSE	3	0 - 38	0 - 2	3	0 - 32	0 - 2	3	9 - 18	1 - 2
bluebunch wheatgrass	PSSP6	3	0 - 95	0 - 5	3	0 - 16	0 - 1			
little bluestem	SCSC	3	0 - 95	0 - 5	3	0 - 80	0 - 5	3	0 - 18	0 - 2
plains reedgrass	CAMO	3	0 - 95	0 - 5	3	0 - 32	0 - 2	3	0 - 9	0 - 1
threeawn	ARIST									
sand dropseed	SPCR				3	0 - 16	0 - 1	3	0 - 18	0 - 2
other perennial grasses	2GP	3	0 - 95	0 - 5	3	0 - 48	0 - 3	3	0 - 27	0 - 3
NON-NATIVE GRASSES		**4**			**4**	**0 - 160**	**0 - 10**	**4**	**45 - 90**	**5 - 10**
cheatgrass	BRTE				4	32 - 160	2 - 10	4	45 - 135	5 - 15
bluegrass	POA									
FORBS		*5*	*95 - 190*	*5 - 10*	*5*	*80 - 160*	*5 - 10*	*5*	*45 - 90*	*5 - 10*
American vetch	VIAM	5	0 - 38	0 - 2	5	0 - 16	0 - 1			
cudweed sagewort	ARLU	5	0 - 38	0 - 2	5	16 - 80	1 - 5	5	27 - 45	3 - 5
curlycup gumweed	GRSQ				5	0 - 16	0 - 1	5	0 - 18	0 - 2
dotted gayfeather	LIPU	5	0 - 38	0 - 2	5	0 - 32	0 - 2	5	0 - 9	0 - 1
false boneset	BREU	5	0 - 38	0 - 2	5	0 - 48	0 - 3	5	0 - 18	0 - 2
false gromwell	ONMO	5	0 - 38	0 - 2	5	0 - 32	0 - 2			
fetid marigold	DYPA									
goldenrod	SOLID	5	0 - 38	0 - 2	5	16 - 32	1 - 2	5	0 - 9	0 - 1
green sagewort	ARDR4	5	0 - 19	0 - 1	5	16 - 48	1 - 3	5	18 - 45	2 - 5
heath aster	SYER	5	0 - 38	0 - 2	5	0 - 48	0 - 3	5	0 - 27	0 - 3
hoary puccoon	LICA12	5	0 - 38	0 - 2	5	0 - 32	0 - 2			
Indian breadroot	PEES	5	0 - 38	0 - 2	5	0 - 32	0 - 2			
milkvetch	ASTRA	5	0 - 38	0 - 2	5	0 - 48	0 - 3	5	0 - 27	0 - 3
mullein	VERBA				5	0 - 16	0 - 1	5	0 - 9	0 - 1
penstemon	PENST	5	0 - 38	0 - 2	5	0 - 32	0 - 2			
prairie coneflower	RACO3	5	0 - 38	0 - 2	5	0 - 48	0 - 3	5	0 - 18	0 - 2
purple coneflower	ECAN2	5	0 - 38	0 - 2	5	0 - 32	0 - 2			
purple prairie clover	DAPU5	5	0 - 38	0 - 2	5	0 - 16	0 - 1	5	0 - 9	0 - 1
pussytoes	ANTEN	5	0 - 38	0 - 2	5	0 - 48	0 - 3	5	0 - 18	0 - 2
scarlet gaura	GACO5	5	0 - 38	0 - 2	5	0 - 32	0 - 2			
scarlet globemallow	SPCO	5	0 - 38	0 - 2	5	16 - 48	1 - 3	5	0 - 27	0 - 3
scurfpea	PSORA2	5	0 - 38	0 - 2	5	16 - 48	1 - 3	5	0 - 27	0 - 3
sweetclover	MELIL				5	0 - 160	0 - 10	5	0 - 90	0 - 10
verbena	VERBE				5	0 - 16	0 - 1	5	0 - 18	0 - 2
western ragweed	AMPS	5	0 - 38	0 - 2	5	0 - 48	0 - 3	5	9 - 45	1 - 5
western yarrow	ACMI2	5	0 - 19	0 - 1	5	0 - 32	0 - 2	5	0 - 18	0 - 2
other perennial forbs	2FP	5	0 - 38	0 - 2	5	0 - 32	0 - 2	5	0 - 18	0 - 2
SHRUBS		*6*	*19 - 190*	*1 - 10*	*6*	*160 - 480*	*10 - 30*	*6*	*315 - 495*	*35 - 55*
big sagebrush	ARTR2	6	0 - 95	0 - 5	6	128 - 320	8 - 20	6	270 - 450	30 - 50
broom snakeweed	GUSA2				6	0 - 48	0 - 3	6	0 - 27	0 - 3
cactus	OPUNT	6	0 - 19	0 - 1	6	0 - 80	0 - 5	6	18 - 45	2 - 5
fringed sagewort	ARFR4	6	0 - 38	0 - 2	6	16 - 80	1 - 5	6	18 - 72	2 - 8
leadplant	AMCA6	6	0 - 95	0 - 5	6	0 - 32	0 - 2			
rose	ROSA5	6	0 - 57	0 - 3	6	0 - 48	0 - 3	6	0 - 18	0 - 2
skunkbush sumac	RHTR	6	0 - 19	0 - 1	6	0 - 16	0 - 1	6	0 - 9	0 - 1
snowberry	SYMPH	6	0 - 57	0 - 3	6	16 - 48	1 - 3	6	0 - 27	0 - 3
winterfat	KRLA2	6	0 - 57	0 - 3	6	0 - 16	0 - 1			
other shrubs	2SHRUB	6	0 - 57	0 - 3	6	0 - 48	0 - 3	6	0 - 27	0 - 3

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	1095 - 1653 - 2010	670 - 1160 - 1385	340 - 428 - 555
FORBS	90 - 143 - 195	75 - 120 - 165	40 - 68 - 95
SHRUBS	15 - 105 - 195	155 - 320 - 550	220 - 405 - 550
TOTAL	1200 - 1900 - 2400	900 - 1600 - 2100	600 - 900 - 1200

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more information is collected, some of these plant community descriptions may be revised or removed, and new ones added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Western Wheatgrass/Needlegrass Plant Community

The interpretive plant community for this site is the Western Wheatgrass/Needlegrass Plant Community. This is also considered the Historic Climax Plant Community (HCPC). This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of deferment.

The potential vegetation is about 80-90% grasses or grass-like plants, 5-10% forbs, and 1-10% shrubs. Cool season grasses dominate this plant community. The major grasses include western wheatgrass, needleandthread and green needlegrass. Other grasses occurring on the site include blue grama, big bluestem, sideoats grama, prairie junegrass, buffalograss and sedge. Significant forbs include scarlet globemallow, prairie coneflower, purple prairie clover, penstemon, American vetch, and milkvetch. The significant shrubs that occur include big sagebrush, leadplant, snowberry, winterfat and rose.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). The diversity in plant species allows for high drought tolerance. This is a healthy and sustainable plant community. Moderate or high available water capacity provides a favorable soil-water-plant relationship. Overall the interpretive plant community has the appearance of being stable, diverse and productive. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:
Growth curve number: SD6001
Growth curve name: Pierre Shale Plains, cool-season dominant.
Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Continuous season-long grazing and no fire will lead to the *Big Sagebrush/Western Wheatgrass Plant Community*. This occurs when the HCPC is exposed to herbivory during the entire growing season at moderate stocking rates.
- Continuous seasonal grazing during the active growing period of cool season plants will lead to the *Blue Grama/Western Wheatgrass Plant Community*.

Blue Grama/Western Wheatgrass Plant Community

This plant community develops under continuous seasonal grazing (i.e., grazing an area during the same season every year) or from over utilization during extended drought periods. The potential vegetation is made up of approximately 75-85% grasses and grass-like species, 5-15% forbs and 1-10% shrubs. The dominant grasses include blue grama and western wheatgrass. Other grasses may include sedge, buffalograss, needleandthread and prairie junegrass. Significant forbs include scarlet globemallow, scurfpea, western ragweed and green sagewort. The dominant shrubs that occur include cactus, broom snakeweed, fringed sagewort and rose.

Compared to the Historic Climax Plant Community, the shortgrass species including blue grama and threadleaf sedge have increased. The cool season species including western wheatgrass and green needlegrass have decreased in composition. Annual bromes, curlycup gumweed, sweetclover and other annual grasses and forbs can invade the site. This plant community can have the appearance of a mosaic, with sod and mixed grass communities intermingled.

This plant community is resistant to change. The dominant herbaceous species are very adapted to grazing; however, the mid grass species and the more palatable forbs will decrease. If the herbaceous component is intact, it tends to be resilient if disturbance is not long-term. Because of the sod forming habit of the shortgrass species, water infiltration is low, and runoff is moderate to high. Typically the runoff is very clean because of the low potential for on-site soil erosion. However, off-site areas may be affected by increased runoff.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:
Growth curve number: SD6003
Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.
Growth curve description: Cool-season, warm-season co-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Prescribed grazing, which allows for adequate plant recovery periods will move this plant community to the *Western Wheatgrass/Needlegrass Plant Community (HCPC)*.
- With heavy continuous seasonal grazing this site will move towards the *Blue Grama/Buffalograss Sod Plant Community*.

Blue Grama/Buffalograss Sod Plant Community

This plant community develops under heavy continuous season-long grazing, or with continuous seasonal grazing with concentrated use in the early part of the growing season (as in calving/lambing pastures). It is made up of approximately 75-85% grasses (primarily short, warm season grasses), 5-20% forbs, and 1-10% shrubs. The dominant grasses include blue grama and threadleaf sedge. Other grasses may include western wheatgrass, prairie junegrass, buffalograss, threeawn, and annual brome. The dominant forbs include western ragweed, green sagewort, cudweed sagewort and scarlet globemallow. The dominant shrubs include fringed sagewort, cactus and broom snakeweed.

Compared to the Historic Climax Plant Community, blue grama and sedge have increased, and the cool-season mid grasses have diminished greatly. Non-palatable forbs and cactus have increased, and non-native species have invaded the site. Plant diversity is low.

This plant community is very stable. Generally, this plant community will require significant management inputs (i.e., high animal impact, long-term prescribed grazing, favorable climatic conditions, etc.) and time to move it towards the Blue Grama/Western Wheatgrass Plant Community. On-site soil erosion is low. Infiltration is low, and runoff is high. Typically the runoff is very clean because of the low potential for on-site soil erosion. However, off-site areas can be significantly impacted due to the increased runoff.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:
Growth curve number: SD6005
Growth curve name: Pierre Shale Plains, warm-season dominant.
Growth curve description: Warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	5	15	25	30	15	7	1	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Long-term prescribed grazing and favorable climatic conditions, which allow for adequate plant recovery periods, may cause a shift to the *Blue Grama/Western Wheatgrass Plant Community*.
- Heavy, continuous season-long grazing, or frequent and severe defoliation (e.g., rodents) will move this plant community to the *Threeawn/Annuals Plant Community*.

Threeawn/Annuals Plant Community

This plant community developed under heavy, continuous season-long grazing and/or severe disturbance. The plant composition is made up of annuals with a few species of perennial forbs and grasses that are very tolerant to frequent and severe defoliation. The potential plant community is made up of approximately 60-80% grasses and grass-like species, 15-30% forbs and 5-20% shrubs. The dominant grasses include threeawn, sedge and cheatgrass. Other grasses may include blue grama, buffalograss, western wheatgrass and six-weeks fescue. The composition of forbs can be highly variable due to climatic conditions. Forbs commonly occurring include fetid marigold, marestail, curlycup gumweed, western ragweed, pussytoes, prostrate verbena and other annual invader-like species. Other plant species, from adjacent ecological sites, can become minor components of this plant community. Compared to the HCPC, percent of bare ground has greatly increased which allows for invasion of Canada thistle and other non-native species. Plant diversity is typically low.

This plant community is resistant to change towards the HCPC because of the loss of plant diversity and overall soil disturbance. It is very susceptible to invasion of non-native plant species. Soil erosion is potentially high because of the bare ground and shallow rooted herbaceous plant community. Water runoff will increase and infiltration will decrease due to animal related soil compaction and loss of root mass due to low plant diversity and vigor.

This plant community will require significant economic inputs and time to move towards another plant community. This movement is highly variable in its succession. This is due to the loss of diversity (including the loss of the seed bank), within the existing plant community, and the plant communities on adjacent sites. This site can be renovated to improve the production capability, however if management changes are not made the vegetation could revert back.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:
Growth curve number: SD6003
Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.
Growth curve description: Cool-season, warm-season co-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Under long-term prescribed grazing, including adequate recovery periods, this plant community may eventually move towards the *Blue Grama/Buffalograss Sod Plant Community*. This will take a long period of time and intensive management.

Big Sagebrush/Western Wheatgrass Plant Community

This plant community develops from continuous season-long grazing and the absence of fire. It is made up of 70-80% mid cool season and short warm season grasses, 5-10% forbs and 10-30% shrubs. The dominant grasses include western wheatgrass, needleandthread, green needlegrass and blue grama. Forbs commonly found on this plant community include cudweed sagewort, scarlet globemallow, hairy goldaster and slimflower scurfpea. Sagebrush canopy typically ranges from 20-30%. Fringed sagewort is also common. As conditions deteriorate, desirable species are replaced by big sagebrush. Blue grama increases in the plant community. Annual brome, other annuals, and Kentucky bluegrass can invade the plant community.

When compared to the HCPC, sagebrush and blue grama have increased. Production of cool-season grasses, particularly needleandthread and green needlegrass, has been reduced. The sagebrush canopy protects the cool-season mid grasses, by making them unavailable for grazing.

Under proper management, this plant community is stable. The soil erosion is low to moderate. Infiltration and runoff are moderate. Subsoil moisture conditions are typically drier due to the high water demand of the big sagebrush. This makes big sagebrush highly competitive with other species.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:
Growth curve number: SD6003
Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.
Growth curve description: Cool-season, warm-season co-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

Transitions or community pathways leading to other plant communities are as follows:

- With brush management and prescribed grazing, this plant community will move towards the *Western Wheatgrass/Needlegrass Plant Community*.
- With brush management alone, this plant community will move towards the *Blue Grama/Western Wheatgrass Plant Community*.
- With continuous season-long grazing and no fire, this plant community will move to the *Big Sagebrush Plant Community*.

Big Sagebrush Plant Community

This plant community is the result of continuous season-long grazing and no fire. Sagebrush dominates this plant community with canopy cover often exceeding 60%. The understory of grass includes western wheatgrass, needleandthread, blue grama, Sandberg bluegrass, and prairie junegrass. The sagebrush canopy protects the cool season grasses, but this protection makes them unavailable for grazing. Big sagebrush is long-lived and will persist for a long period.

This plant community differs from the Historic Climax Plant Community by an increase in big sagebrush and a decrease in grasses such as green needlegrass and big bluestem.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:
Growth curve number: SD6004
Growth curve name: Pierre Shale Plains, warm-season dominant, cool-season sub-dominant.
Growth curve description: Warm-season dominant, cool-season sub-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	18	25	25	15	7	1	0	0

Transitions or community pathways leading to other plant communities are as follows:

- With brush management and long-term prescribed grazing, this plant community may eventually return to the *Big Sagebrush/Western Wheatgrass Plant Community*.

Excessive Litter, Go-back, Introduced, or Invaded

This group includes four separate vegetation states that are highly variable in nature. They are derived through four distinct management scenarios, and are not related successionally. Infiltration, runoff and soil erosion varies depending on the vegetation present on the site.

The **Excessive Litter** state develops from extended periods of exclusion by large herbivores, fire suppression and lack of other surface disturbance. Plant litter accumulates in large amounts when this community first develops. Litter buildup reduces mature plant vigor and density, and seedling recruitment declines. Eventually litter levels become high enough that plant density decreases. Interspaces are commonly filled by annual forbs, annual grasses, and cryptogams. Typically rhizomatous grasses form small colonies because of a lack of tiller stimulation.

The **Go-back** state can be reached whenever severe mechanical disturbance (i.e., abandoned farmland) occurs. During the early successional stages, the species that mainly dominate are annual grasses and forbs, later being replaced by both native and introduced perennials. The vegetation on this site varies greatly, sometimes being dominated by three-awn, annual brome, crested wheatgrass, buffalograss, broom snakeweed, sweetclover and non-native thistles. Other plants that commonly occur on the site include wheatgrass, deathcamas, prickly lettuce, marestail, kochia, squirreltail, foxtail and sunflowers.

The **Introduced** state is normally those areas seeded to crested wheatgrass, pubescent or intermediate wheatgrass and alfalfa. It requires considerable investment to establish and have a variable life expectancy.

The **Invaded** state includes areas that have been invaded, and are dominated by species such as smooth brome, Kentucky bluegrass, crested wheatgrass, non-native thistles, field bindweed, knapweeds, leafy spurge, hoary cress and other introduced species.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Western Wheatgrass/Needlegrass Plant Community: The predominance of grasses in this vegetative state favors grazers and mixed-feeders, such as bison and antelope. Suitable thermal and escape cover for deer may be limited due to the low quantities of woody plants. However, topographical variations could provide some escape cover. Portions along woody vegetative states may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include Western meadowlarks, horned larks, and golden eagles. Many grassland obligate small mammals would occur here. Swift fox and a number of non-game grassland bird species will do better in some of the other plant communities on this site which have less height/density of the cool season grasses.

Blue Grama/Western Wheatgrass Plant Community: Wildlife, such as shortgrass prairie bird species, and swift fox would benefit from the reduced cover. Upland game bird habitat quality would decline. The diversity of this plant community is still high enough to support many of the species that would be present with the HCPC.

Blue Grama/Buffalograss Sod Plant Community: This plant community provides limited foraging for antelope and other grazers. It may be used as a foraging site by sage grouse if proximal to woody cover and if the Historic Climax Plant Community or the Western Wheatgrass/Bluegrass Plant Community are limiting. Generally, this plant community is not a target for wildlife habitat management. Wildlife, such as shortgrass prairie bird species, and swift fox would benefit from the reduced cover. Upland game bird habitat quality would decline.

Threeawn/Annuals Plant Community: Benefits to other wildlife are largely due to the subterranean structure created by the prairie dogs. It may be a desirable plant community if the goal is to provide habitat for burrowing owls or black-footed ferrets. Many native grassland wildlife species are directly or indirectly reliant on prairie dog habitat. As a result, this type of habitat is very important from an ecosystem management basis.

Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
bluebunch wheatgrass	U P D D	P P P P	U P D D	D D D D	D D D D	U P D D	U P D D
buffalograss	U U D U	N U D U	U U D U	N U D U	N U D U	U U D U	U U D U
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
plains reedgrass	U D U U	N D N N	U D U U	N D N N	N D N N	U D U U	U D U U
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
Sandberg bluegrass	N U N N	N D N N	N U N N	N D N N	N D N N	N U N N	N U N N
sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
dotted gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
false gromwell	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
hoary puccoon	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
Indian breadroot	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
milkvetch	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
pussytoes	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
scarlet gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
Shrubs							
big sagebrush	U N U U	D U U D	U N U U	P U D P	P P P P	U N U U	D U U U
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
skunkbush sumac	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D
snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
winterfat	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic
† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

As this site improves in condition through proper management (from the more short grass dominated plant communities to the HCPC), the advantage for livestock production includes: higher forage production from cool season grasses, improved early spring forage production and higher water infiltration. The disadvantage for livestock include: reduction in cool/warm season grass mix which would provides better management flexibility, less plant diversity, and a potential increase in soil erosion. The Threeawn/Annuals Plant Community is of limited value for livestock production.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Western Wheatgrass/Needlegrass (HCPC)	1900	0.60
Blue Grama/Western Wheatgrass	1100	0.35
Blue Grama/Buffalograss Sod	600	0.19
Threeawn/Annuals	700	**
Big Sagebrush/Western Wheatgrass	1600	0.45
Big Sagebrush	900	0.20

* Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

** Highly variable; stocking rate needs to be determined on site.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B and C. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a strong sod and dominate the site. Normally areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

Other Products
Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites
(060AY011SD) – Clayey 13-16" P.Z.
(060AY020SD) – Loamy Overflow
(060AY009SD) – Sandy
(060AY024SD) – Shallow Loamy
(060AY012SD) – Thin Upland

Similar Sites
(060AY011SD) – Clayey 13-16" P.Z.
[green needlegrass dominant; needleandthread minor component]
(060AY020SD) – Loamy Overflow
[less needleandthread; more big bluestem; more productive]

Inventory Data References
Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site description include: Everet Bainter, Range Management Specialist, NRCS; Stan Boltz, Range Management Specialist, NRCS; Brandon Brazee, Range Management Specialist, NRCS; Darrel DuVall, Range Management Specialist, NRCS; Jill Epley, Range Management Specialist, NRCS; Glen Mitchell, Range Management Specialist, NRCS; Cheryl Nielsen, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; Maxine Rasmussen, Range Management Specialist, NRCS; Mike Stirling, Range Management Specialist, NRCS.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417	1	1969	NE	Sioux

State Correlation
This site has been correlated between Montana, Nebraska, South Dakota & Wyoming in MLRA 60A.

Field Offices
Belle Fourche, SD	Chadron, NE	Gillette, WY	Newcastle, WY	Sundance, WY
Broadus, MT	Ekalaka, MT	Hot Springs, SD	Rapid City, SD	Wall, SD
Buffalo, SD	Faith, SD	Lusk, WY	Sturgis, SD	

Relationship to Other Established Classifications
Level IV Ecoregions of the Conterminous United States: 43e – Sagebrush Steppe, 43g – Semiarid Pierre Shale Plains, and 43k – Dense Clay Prairie.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)

USDA, NRCS, 2002. National Soil Survey Handbook, title 430-VI. (http://soils.usda.gov/procedures/handbook/main.htm)

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

_____	_____	_____	_____
MT, State Range Management Specialist	Date	NE, State Range Management Specialist	Date
_____	_____	_____	_____
SD, State Range Management Specialist	Date	WY, State Range Management Specialist	Date